SPRINKLER DESIGN INTENT
2002 NFPA 13R and 2002 NFPA 13
(To Accompany Architectural Review)

Listed items require revision/clarification by contractual documentation (i.e., revised drawings, specifications, addenda, etc.) before plans can be approved. Answers in letter form are *not* acceptable. The Design Intent must be submitted by a sprinkler system engineer or architect. **Starting construction before plan approval may be considered as just cause, by the State, to issue a stop work order. [Rule 0780-2-7-.09]**

I. Architectural

1. An NFPA 13R sprinkler system may only be installed in residential occupancies up to and including 4 stories in height. [NFPA 13R 1.1]

II. Submittal Requirements

1. Provide two sets of engineer designed and sealed fire protection plans with preliminary hydraulic calculations.

III. Underground/Site

1. Provide the following information on a site plan: [NFPA 13R 6.5.3]

   A. Identify the location and size of the city main at the sprinkler system tap. Show the location of the domestic water tap. All piping from the "point of service" including underground used for sprinkler or standpipe system must be installed by a Tennessee registered sprinkler contractor. [Rule 0780-2-7-.08] Show location of point of service for the underground sprinkler piping on the site plan and provide a note about requirement for Tennessee registered sprinkler contractor.
   B. Provide details of the underground piping from the city main to the building identifying: line size and type, depth of bury, valve locations, etc. [NFPA 13R 5.2.1]
   C. At least one 1½" fire department connection must be provided for buildings greater than 2000 ft² or more than one story. [NFPA 13R 6.6.4.1 and .2]
   D. The pumper fire hydrant must be within 100 feet of the fire department connection. [Office Policy]
   E. If applicable, show the fire pump and/or tank location. Additional information must be provided, see the attached Fire Pump and/or Tank check list. [NFPA 13 15.2 and 2002 NFPA 24 5.6 and 5.7]
   F. Identify the location of the test fire hydrant and provide flow test information including: static psi, residual psi and gpm, tester, company, date and time, and the hydrant elevation.

IV. Water Supply Availability and System Demand

1. Identify the highest demand area for areas inside the dwelling unit. [NFPA 13R 6.7.1.1, 6.7.1.2, and 6.7.1.4]

   A. For flat, smooth, horizontal ceilings, identify the compartment with the greatest hydraulic demand (a maximum of 4 heads must be calculated). For sloped, beamed, and pitched ceiling areas, all heads in the compartment must be calculated (no maximum).
   B. Provide two sets of *preliminary* calculations with: 1) a single head operating at 18 gpm, 7 psi; 2) multiple heads operating at 13 gpm, 7 psi; or, where specific discharge criteria heads are used, provide cut sheets and calculations for single and multiple discharge criteria. [NFPA 13R 6.7.1.1 and 6.7.1.4]
   C. For systems with a common domestic and fire supply main, the domestic demand must be added to the system flow. Use Table A.6.5.5(a) and (b) to determine the flow. Domestic demand does not have to be added where an automatic domestic cutoff valve activates upon sprinkler line flow. [NFPA 13R 6.5.5]
   D. Provide a water supply/sprinkler system demand graph.

2. For areas outside the dwelling unit see NFPA 13R 6.7.2.

3. For garages see NFPA 13R 6.7.3.

V. Above-Ground

1. Identify the type of sprinkler system used. A wet system must be used where temperatures can reliably be maintained above 40°F. Where subject to freezing, an antifreeze, dry, preaction, or listed dry heads must be used. [NFPA 13R 5.3]

2. Identify type of pipe or tube materials used for the sprinkler system. [NFPA 13R 5.2.1 and Table 5.2.1] When CPVC piping is used, attach a copy of the Installation Manual on the design plans submittal. [NFPA 13R 5.2.2.2 and Table 5.2.2.2]

3. Sprinklers shall be installed in all areas except: [NFPA 13R 6.8.1]

   A. Sprinklers shall not be required in bathrooms where both of the following conditions are met: (1) The bathroom area does not exceed 55 ft^2; (2) The walls and ceilings, including walls and ceilings behind fixtures, are of noncombustible or limited-combustible materials providing a 15-minute thermal barrier. [NFPA 13R 6.8.2]
   B. Sprinklers shall not be required in clothes closets, linen closets, and pantries within the dwelling units that meet all of the following conditions: (1) The area of the space does not exceed 24 ft^2; (2) The least dimension does not exceed 3 ft; (3) The walls and ceilings are surfaced with noncombustible or limited-combustible materials as defined by 1999 NFPA 220, *Standard on Types of Building Construction*. [NFPA 13R 6.8.3]
   C. Sprinklers shall not be required in any porches, balconies, corridors, and stairs that are open and attached. [NFPA 13R 6.8.4]
   D. Sprinklers shall not be required in attics, penthouse equipment rooms, elevator machine rooms, concealed spaces dedicated exclusively to and containing only dwelling unit ventilation equipment, crawl spaces, floor/ceiling spaces, elevator shafts, and other concealed spaces that are not used or intended for living purposes or storage and do not contain fuel-fired equipment. [NFPA 13R 6.8.5]

E. Sprinklers shall not be required in closets on exterior balconies, regardless of size, as long as there are no doors or unprotected penetrations from the closet directly into the dwelling unit. [NFPA 13R 6.8.6]

4. Provide a system riser schematic with control and check valves, supply and system pressure gauges, fire department connection location, waterflow alarm switches, local waterflow alarm type and location, tamper switches, and spare sprinkler heads. [NFPA 13R 6.6 and A6.5.3]

5. A single control valve arranged to shut off both the domestic system and the sprinkler system shall be installed for systems with common sprinkler/domestic mains. [NFPA 13R 6.6.1.1] A separate shut off valve shall be installed for the domestic line. [NFPA 13R 6.6.1.3]

6. A sprinkler system shut off valve is permitted only when it is electronically supervised by a fire alarm system. [NFPA 13R 6.6.1.2 and 1999 SBC 903.8]

7. Provide a waterflow alarm switch and specify connection to the general building alarm. [NFPA 13R 6.6.8]

8. Provide a 1” drain with a separate valve on the system side of the control valve. [NFPA 13R 6.6.2.1, .2, and .3] A ½” drain is required at each trapped portion of a dry system that is subject to freezing. [NFPA 13R 6.6.2.4]

9. Provide a 1” test connection with a separate valve on the system side of the waterflow alarm switch. [NFPA 13R 6.6.3.1, .2, .3, and .4]

10. Specify seismic restraint for piping in seismic areas required by 1999 SBC 1607.6. Specify flexible couplings at flexure joints (NFPA 13 9.3.2) and, where required, clearance around piping passing through floors and walls and foundations per NFPA 13 9.3.4. [NFPA 13R 6.6.6]

11. Sprinkler lines cannot penetrate a four-hour firewall. [Office Policy per 1999 SBC 503.1.2 - These are two separate buildings and must be protected separately] Separate sprinkler risers and lead-ins are required for each portion of the building.